

## How acute stress impairs self-control in goal-directed choice: Behavioral and neural evidence

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Moderately stressful events are a common occurrence in daily life: getting stuck in traffic before an appointment, having an upsetting meeting at work, or a quarrel with one's partner. Important choices often have to be made after such events that might compromise self-regulatory behavior. Yet the neural mechanisms through which acute stress influences self-control choices are unclear. Using fMRI, we investigated these mechanisms in humans who faced self-control challenges over food rewards. Behaviorally, we found that stress increased the influence of immediately rewarding taste attributes on choice and reduced self-control. On the neural level, stress increased functional connectivity between ventromedial prefrontal cortex (vmPFC) and amygdala and striatal regions that encoded tastiness. Moreover, stressed individuals showed decreased connectivity between the vmPFC and dorsolateral prefrontal cortex regions associated with self-control success. Notably, the connectivity changes in these two pathways that signal information about the stimulus and current goals were related to different aspects of the stress reaction: while the strength of cortisol expression was linked to stronger signaling of immediate reward, the perception of being stressed was associated with reduced signaling in favor of self-control goals. Both effects combined to impair self-control. Our results highlight that self-control in goal-directed choice is maintained through a careful balance of connectivity in the brain's value computation systems. Understanding these mechanisms may allow for targeted interventions to attenuate the effects of stress on self-control.